

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) A semiconductor device, wherein comprising:

a base layer comprising a semiconductor substrate;
an interlayer dielectric film having Si-H bonds is provided on a over the base layer; including a semiconductor substrate and

a silicon carbon nitride film [[is]] formed [[on]] over said interlayer dielectric film;

an interconnection trench lined with a barrier metal nitride film, the barrier metal nitride film being non-occluding to hydrogen and contacting the interlayer dielectric film having the Si-H bonds and the base layer; and

an electrically conductive film filling an interior side of the interconnection trench, the conductive film forming a damascene interconnection.

2. (currently amended) The semiconductor device according to claim 1, wherein [[an]] the electrically conductive film containing contains Cu as a main component element is embedded in a trench formed in said interlayer dielectric film

and the silicon carbon nitride film is formed on contacts said electrically conductive film.

3. (original) The semiconductor device according to claim 2, wherein said interlayer dielectric film and said electrically conductive film are each formed in a plurality of layers and said silicon carbon nitride film is formed so as to cover said electrically conductive film and said interlayer dielectric film each in a top layer.

4. (original) The semiconductor device according to claim 1, wherein said silicon carbon nitride film has a nitrogen concentration of not less than 10 atm % but less than 35 atm %.

5. (original) The semiconductor device according to claim 2, wherein said silicon carbon nitride film has a nitrogen concentration of not less than 10 atm % but less than 35 atm %.

6. (original) The semiconductor device according to claim 1, wherein said silicon carbon nitride film has a nitrogen concentration of not less than 15 atm % but not more than 30 atm %.

7. (original) The semiconductor device according to claim 2, wherein said silicon carbon nitride film has a nitrogen

concentration of not less than 15 atm % but not more than 30 atm %.

8. (original) The semiconductor device according to claim 6, wherein said silicon carbon nitride film contains not less than 22 atm % but not more than 27 atm % Si, not less than 20 atm % but not more than 25 atm % C, and not less than 35 atm % but not more than 45 atm % H.

9. (original) The semiconductor device according to claim 7, wherein said silicon carbon nitride film contains not less than 22 atm % but not more than 27 atm % Si, not less than 20 atm % but not more than 25 atm % C, and not less than 35 atm % but not more than 45 atm % H.

10. (original) The semiconductor device according to claim 4, wherein said silicon carbon nitride film further contains not less than 0.5 atm % but less than 5 atm % O.

11. (original) The semiconductor device according to claim 5, wherein said silicon carbon nitride film further contains not less than 0.5 atm % but less than 5 atm % O.

12. (original) The semiconductor device according to claim 1, wherein said interlayer dielectric film having Si-H

bonds is a ladder-type hydrogenated polysiloxane film or a porous ladder-type hydrogenated polysiloxane film.

13. (original) The semiconductor device according to claim 2, wherein said interlayer dielectric film having Si-H bonds is a ladder-type hydrogenated polysiloxane film or a porous ladder-type hydrogenated polysiloxane film.

14. (currently amended) The semiconductor device according to claim 2, wherein [[a]] the metal nitride film is provided between said interlayer dielectric film and said electrically conductive film containing said Cu as a main component element and includes a metal film [[is]] provided between said electrically conductive film containing said Cu as a main component element and said metal nitride film, the metal nitride film having a nitrogen concentration of not less than 15 atm % but less than 40 atm %.

15. (original) The semiconductor device according to claim 2, wherein said electrically conductive film containing Cu as a main component element is a Cu alloy film containing at least one kind selected from the group consisting of Al, Si, Ag, W, Mg, Bi, Zn, Pd, Cd, Au, Hg, Be, Pt, Zr, Ti and Sn.

16. (original) The semiconductor device according to claim 2, wherein said electrically conductive film containing Cu as a main component element is a Cu alloy film containing Si and the Si content is highest on a top surface of the electrically conductive film and gradually decreases with increasing depth in the direction of a bottom surface.

17-32. (canceled)

33. (new) A semiconductor device, comprising:
a lower-layer insulating film;
a first silicon carbon nitride insulating film in contact with the lower-layer insulating film;
a first L-Ox film in contact with the first silicon carbon nitride insulating film, the first L-Ox film being a ladder-type hydrogenated polysiloxane film;
a first SiO₂ film in contact with the first L-Ox film;
a laminated film comprising a first upper, inside Ta film layer and a first lower, outside TaN film layer forming a first interconnection trench within the first silicon carbon nitride insulating film, the first L-Ox film and the first SiO₂ film; and
a first copper film filling an interior side of the first interconnection trench and contacting an inner side of the

first Ta film, the first copper film forming a copper damascene interconnection,

the first TaN film layer contacting the first L-Ox layer and being non-occluding to hydrogen.

34. (new) The device of claim 33, wherein,

the TaN film has a nitrogen concentration of not less than 15 atm % but less than 40 atm %, and

the silicon carbon nitride insulating film comprises as main component elements Si, C, N and H.

35. (new) The device of claim 34, further comprising:
a second silicon carbon nitride film contacting said first copper film and said first SiO₂ film;

a second L-Ox film and a second SiO₂ film 110 formed on said first SiO₂ film; and

a second laminated film comprising a second upper, inside Ta film layer and a second lower, outside TaN film layer forming a second interconnection trench within the second silicon carbon nitride insulating film, the second L-Ox film and the second SiO₂ film, the second TaN film layer contacting the second L-Ox layer and being non-occluding to hydrogen.

36. (new) A semiconductor device, comprising:

a lower-layer insulating film;

a first silicon carbon nitride insulating film in contact with the lower-layer insulating film;

a first L-Ox film in contact with the first silicon carbon nitride insulating film, the first L-Ox film being a ladder-type hydrogenated polysiloxane film;

a first SiO_2 film in contact with the first L-Ox film;

a laminated film comprising a first upper, inside barrier metal film layer and a first lower, outside barrier metal nitride film layer forming a first interconnection trench within the first silicon carbon nitride insulating film, the first L-Ox film and the first SiO_2 film; and

a first copper film filling an interior side of the first interconnection trench and contacting an inner side of the first inside metal film, the first copper film forming a copper damascene interconnection,

the first metal nitride film layer contacting the first L-Ox layer and being non-occluding to hydrogen.

37. (new) The device of claim 36, wherein, the first metal nitride layer is a first TaN film with a nitrogen concentration of not less than 15 atm % but less than 40 atm %.

38. (new) The device of claim 37, further comprising:

a second silicon carbon nitride film contacting said first copper film and said first SiO_2 film;

a second L-Ox film and a second SiO_2 film 110 formed on said first SiO_2 film; and

a second laminated film comprising a second metal film layer and a second lower, outside TaN film layer forming a second interconnection trench within the second silicon carbon nitride insulating film, the second L-Ox film and the second SiO_2 film, the second TaN film layer contacting the second L-Ox layer and being non-occluding to hydrogen.

39. (new) The device of claim 36, wherein, the first metal nitride layer is a first TiN film.